THE SCOTCH FORESTS OF THE EARLS OF SEAFIELD AND MANSFIELD, THE DUKE OF ATHOLE.

MESSRS. LAWSON AND SONS' NURSERIES NEAR EDINBURGH.

These nurseries, mentioned by Dr. Brandis in his Memorandum for the Guidance of Forest Officers on leave, are situated between Edinburgh and Granton, and extend over 270 acres. Mr. Lawson gave me every facility for making myself acquainted with the system pursued; and my thanks are due to Messrs. Syme and Johnston, his assistants, for the trouble they took to show me everything worthy of note, and the time which they devoted to me. My visits extended over a week, which I consider to have been most usefully employed, although how far the system of the treatment of seedlings in this country can be applied to India remains to be proved by experiment.

The chief crop in the nurseries is composed of *coniferæ* of all varieties, of which Mr. Johnston informed me there were not less than thirty millions at the time of my visit.

Besides the Scotch fir, spruce, and larch, the *Pinus pinaster*, *Austriaca*, and *Laricio* appear to be most in demand.

The first is largely used for planting on light sandy soils near the sea. *Pinus austriaca* is in great demand for Ireland, and the last is now being tried in most of the pine plantations of the United Kingdom, having one great advantage, viz., that game, particularly rabbits, do not like it, and will not attack it, unless during very severe weather, and in the absence of all other herbage.

Before sowing or forming the nursery beds the land is trenched to a depth of 14 inches, and a crop of potatoes taken off it to clean it. In the following spring the seed beds are laid out, and the upper soil carefully prepared to suit the nature of the tree which is to be sown.

Most of the *coniferæ* prefer a light dry soil with a considerable proportion of sand, and this has the advantage that the seedlings are easily picked out and shaken free from each other on transplanting.

In the case of Scotch fir and larch, the seed is sown in May and June, and left in the seed beds for two seasons. The seedlings are then planted out in lines 14 inches apart,

and three inches between each plant; they are left thus for one or sometimes two years, and then planted out for good.

Mr. Johnston appeared to think it better to sow as early in May as possible, or even in April, and transplant after one year, or even in the same autumn, directly the leaf-bud is hard; but there is risk of frost in April, and even early in May, which would of course destroy any seedlings coming up then.

The spruce requires to be left two full years in the seed beds, as its growth while young is slower than that of larch or Scotch fir.

The *P. pinaster, Austriaca,* and *Laricio,* are sown in May or June, and transplanted in the autumn of the same year into rows six inches apart, the plants close together. Thence they are re-transplanted in the following autumn, into rows 14 inches apart, as is done with the Scotch fir, &c., where they are left one and even two years before being planted out.

In this and similar cases, the first removal is termed "bedding," and the second, when each seedling is put out separately in the row, "transplanting." Thus, we hear of "one year seedlings, one year bedded, and two years trans-"planted," which means that the young tree was one year in the seed bed, one year in the close rows, and two years in the open rows before being planted out.

Little or no care is taken of the tap-roots; in fact, it is considered an object to shorten them, and encourage the formation of lateral and fibrous roots instead. In cases where the seedlings are left two consecutive years without transplanting, which occurs if the growth is slow or the demand slack, the roots are cut over with the spade about eight or ten inches below the surface to prevent the growth of a long tap-root.

In fact, the attention of the nurseryman is mainly devoted to checking any excessive vertical growth either of stem or root, and to encouraging the formation of fine radical fibres. This is exactly the opposite to what has been impressed on us in Madras, where, both with regard to the *Eucalypti* and *Acaciæ* on the hills, and the *P. pinaster* (*maritima*), with which so many experiments were made, our main endeavour and difficulty has been to preserve the tap-root intact.

There may be reasons for this in India, but I am not aware that the subject has received that attention in the Madras Presidency which it appears to deserve. The saving of trouble, time, and expense, by not having to be careful about the tap-root, is enormous, although, of course, we could

never with impunity treat seedlings in India in the rough manner in which they are treated in a temperate climate. Here they are lifted, tied in bundles, tossed into a cart, and transported to Ireland, or even across the Atlantic to Canada (where I was astonished to hear Messrs. Lawson have contracts for planting), in a manner marvellous to an Indian forester accustomed to deal with each individual seedling in a careful manner, and to see even the slightest rough handling result in the loss of the young tree. I cannot help thinking that our nursery management admits of much improvement; hence the cause of the extreme delicacy of our young trees.

I saw all the operation of lifting and packing the young trees, besides transplanting, &c.

The crop of hard wood in the nurseries is not extensive, but includes all the principal species most in demand.

I had almost forgotten to note that there are several beds of deodar doing well, and *Cupressus torulosa* flourishes here as well as on the Neilgherry and Pulney Hills.

The Earl of Seafield's Woods and Plantations in Strathspey.

I spent a week in Strathspey, and obtained much valuable information as to the growth of *coniferæ* from Mr. Grant Thomson, Lord Seafield's wood manager, to whom I am greatly indebted for his courtesy and the anxiety he evinced to show me all he could in the time at my disposal.

The tract of country, chiefly moorland, under his charge extends to at least 60,000 acres, of which 30,000 to 40,000, or a little more than half, is now actually under timber. Mr. Thomson's wish is gradually to plant up the whole, so that, in the course of time, 1,000 acres could be felled annually, and a like extent planted out, and I think the object cannot be too steadily kept in view, as it could not fail to bring in a large revenue, without impoverishing the forests, or, so to speak, trenching on the capital in timber.

Mr. Grant Thomson considers that the sale of thinnings, grazing dues, &c., should suffice not only to pay the establishments employed (including his own salary), and the working expenditure for the nursery planting, fencing, &c., but also the rental of the land, which of course is very low, leaving all the proceeds from actual clearing, or what is known as a "clean cut," as clear profit.

The woodlands are divided into three districts, known as Grantown, Abernethy, and Duthil, each under the immediate charge of a forester, who is responsible to Mr. Thomson for all the work of his district.